Operational Concept Description (OCD) for the Modeling and Simulation Resource Repository (MSRR)

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TABLE OF CONTENTS

Appendices

1. SCOPE

This document describes the operational concept of the modeling and simulation (M&S) community's Modeling and Simulation Resource Repository (MSRR).

1.1 MSRR System Overview

a. The MSRR is a collection of M&S registered resources and resource references, logically organized by information domains (IDs) within ID categories, and physically implemented using a distributed system of resource servers connected through the World Wide Web (WWW). The MSRR provides an additional layer of services above the WWW that includes registration of resources, users, and nodes; description and quality tagging of resources; security and releasibility; and specialized search capabilities. The MSRR will be under configuration management (CM) (ref 2.1a). MSRR users include resource consumers and providers. The consumer view of the MSRR is through the ID categories built by the MSRR supporting staff [Information Domain Coordinators (IDCs), resource providers, and Registrar]. This view provides maximum user flexibility and allows users to navigate to resources logically irrespective of location and physical organization.

b. The MSRR objectives were first established in the Department of Defense (DoD) Modeling and Simulation Master Plan (MSMP) (ref 2.1b), subobjective 5-3, "To provide a repository system to facilitate developer and end-user access to M&S resources."

c. The MSRR sponsor and acquirer is the Defense Modeling and Simulation Office (DMSO) under the Under Secretary of Defense for Acquisition and Technology [USD(A&T)]. The developer of the MSRR is the Army's Electronic Proving Ground (EPG), Fort Huachuca, Arizona. DMSO is the Government technical support organization for the MSRR with guidance from the Modeling and Simulation Working Group (MSWG).[1]

1.2 Document Overview

a. The purpose of this document is to describe the operational concepts of the MSRR to the M&S community.[2] These concepts include use of the MSRR and services (including security) provided by the MSRR. This document describes in general terms interaction between the MSRR and resource providers, resource consumers, Node Administrators (NAs), and IDCs.

b. There are no security or privacy restrictions on the use of this document.

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[1] The MSWG is an O-6 military officer or GS-15 grade civilian group that promotes coordination and cooperation of DoD M&S at the working level, supports the activities of the Executive Council for Modeling and Simulation (EXCIMS), and responds to guidance and direction from USD(A&T). EXCIMS is an organization established by USD(A&T) that is responsible for providing advice and assistance on DoD M&S issues. Its membership is determined by USD(A&T) and is at the Senior Executive Service, flag, and general officer level.

[2] The M&S community is defined as all DoD organizations, plus their supporting agencies and companies, working with M&S.

2. REFERENCED AND APPLICABLE DOCUMENTS

2.1 General

a. Configuration Management Plan for the Modeling and Simulation Resource Repository (MSRR), Final Draft, 1 August 1996.

b. DoD 5000.59-P, Modeling and Simulation (M&S) Master Plan (MSMP), October 1995.

c. Operations Guide for the Modeling and Simulation Resource Repository (MSRR), Draft, 30 September 1966.

d. User's Guide for the Modeling and Simulation Resource Repository (MSRR V.0.1), Initial Draft, 6 September 1996.

e. System/Subsystem Specification for the Modeling and Simulation Resource Repository Operational Prototype (MSRR V.0.2), Initial Draft, 9 September 1996.

f. Architecture Document for the Modeling and Simulation Resource Repository (MSRR), Final Draft, 23 August 1996.

g. Software Development Plan (SDP) for the Modeling and Simulation Resource Repository (MSRR), Draft, 9 September 1996.

h. Technical Architecture for Information Management (TAFIM), June 1994.

i. Defense Information Infrastructure Common Operating Environment, October 1995.

j. DoD Joint Technical Architecture (JTA), 19 June 1996.

2.2 Security

a. Data Security Requirements for the Modeling and Simulation Resource Repository MSRR), Draft, 29 June 1996.

b. Modeling and Simulation Resource Repository (MSRR) Node Administrator's Security Guide, 30 June 1996.

3. CURRENT SYSTEM OR SITUATION

3.1 Objectives and Scope. There is no current system. The MSRR will fill a void which has been identified and documented in the MSMP (ref 2.1b).

3.2 Description of Current Situation. The current situation is that developers and end-users must know or find out on their own where resources reside and identify the points of contact to obtain access to the resource for sharing or reuse. The process is mostly manual, prone to error, and, even with the use of the Internet, involves tedious searches to obtain information about a specific resource.

4. JUSTIFICATION FOR AND NATURE OF CHANGES

4.1 Justification for Change

a. Prior to 1990, the field of M&S was fragmented, with limited coordination of activities across key communities (e.g., across Service lines and functional communities). DMSO was formed in response to Congressional direction to DoD to establish a joint program office for simulation in order to coordinate simulation policy; establish interoperability standards and protocols; and establish guidelines and objectives for coordination of simulation, wargaming, and training.

b. The development of the means for making M&S resources easily accessible and available to the community is essential to the fulfillment of DMSO's mission. The DoD (and the M&S community) has lacked completed catalogs to resources such as models and simulations, data and information, authoritative sources, and M&S organizations. These shortfalls have resulted in costly duplications of effort; lack of interoperability among models and simulations; lack of credibility of M&S results used by decision makers, wargamers, and trainers/trainees; and disconnects with the command, control, communications, computers, and intelligence (C4I) community. With the advent of the DoD M&S common technical framework, composed of the High Level Architecture (HLA), Conceptual Models of the Mission Space (CMMS), and Data Standards, the MSRR will be the means to make the essential M&S resources easily accessible for browsing and reuse. The fundamental MSRR philosophy is that resources reside with and are maintained by their owners/developers. Resources will be distributed by the owners/developers.

4.2 Description of Needed Changes

a. The following statement, taken from the MSMP (ref 2.1b), describes the changes that are needed within the M&S community:

> *DoD must establish a distributed system of M&S Resource Repositories (MSRRs) to efficiently and effectively provide the community with timely, verified and validated data, metadata, algorithms, models, simulations, and tools. The MSRRs should also provide background information (e.g., model assumptions, source of data, classification of data, range of data, validity of algorithms, VV&A/C history). This will promote reuse and sharing of M&S resources and will improve credibility of M&S results. These repositories will provide tools for configuration management and for accessing, browsing, and retrieving M&S resources.*

b. The MSRR will be developed under the following guidelines:

(1) Provide initial operational capability within FY96.

(2) Maintain the operational capability throughout its life cycle.

(3) Evolve the capability to leverage emerging technologies.

(4) Maintain compatibility with previously entered data and among evolving nodes throughout the system.

5. CONCEPT OF THE NEW SYSTEM

The MSRR is a collection of M&S registered resources and resource references logically organized by IDs and physically implemented using a distributed system of resource servers connected through the WWW. The MSRR provides an additional layer of services above the WWW that includes registration of resources, users, and nodes; description and quality tagging of resources; security and releasibility; and specialized search capabilities. The MSRR will be under CM. The MSRR will be part of the DoD Repository System (DDRS). It is planned that the MSRR link to the DDRS will provide data models, standards, etc., to M&S users.

5.1 Objectives and Scope of MSRR

a. The MSRR will provide a distributed repository for approved M&S resources. The primary objectives of the MSRR are to provide members of the M&S community with a facility to electronically

(1) Register users, nodes, and resources with the MSRR Registrar.

(2) Store location and descriptive information about M&S resources.

(3) Protect sensitive but unclassified (SBU) data.

(4) Store selected M&S resources.

(5) Search for resources via the ID categories, using search engines and database queries on the master registration database.

(6) Access authorized descriptive information about M&S resources.

(7) Move among the MSRR nodes and review resources on those nodes while retaining an MSRR identity.

(8) Access authorized M&S resources stored on the MSRR or on nodes external to the MSRR.

(9) Order M&S resources from resource providers.

b. The MSRR applies to all acquisition, analysis, and training activities performed by any DoD M&S organization.

5.2 Operational Policies and Constraints of MSRR

a. The following policies and constraints apply to the MSRR:

(1) Access to resources must be controlled in accordance with security (e.g., releasibility) policies established by the resource owner.

(2) Registration of users, nodes, and resources must be approved before being added to the MSRR and will be in accordance with registration procedures, quality criteria, and security/releasibility guidelines documented in the appendices to the Operations Guide for the MSRR (ref 2.1c) and the User's Guide for the MSRR (ref 2.1d).

(3) Information will be organized into IDs and administered by DMSO-appointed/approved IDCs.

(4) Registered users may search across the master MSRR registration database and access all private areas for which they are authorized.

(5) Nonregistered users may access only public areas.

b. Policies and constraints are embodied in the Architecture Document for the MSRR (ref 2.1f) and the Operations Guide for the MSRR (ref 2.1c).

5.3 Description of the MSRR System

a. The developmental MSRR is an evolutionary system that is being developed within the following phases:

Phase I	-	Proof-of-Concept Prototype	September 1996
Phase II	-	Operational Prototype	February 1997
Phase III	-	Initial Operating Capability (IOC)	February 1998
Phase IV	-	Final Operating Capability (FOC)	February 1999

b. Phase I will consist of 10 operational nodes with functionality to include automated registration, initial MSRR taxonomy, identification of the first set of IDs and their coordinators, first-level password security system, registered resources, capability to search the "ID categories"[3] for registered resources, and complete documentation suite and CM procedures. Operational capabilities for Phases II through IV will be specified in the MSRR documentation. [See System/Subsystem Specification for the MSRR (ref 2.1e).]

c. Figure 1 illustrates how users will see the MSRR. Resource consumers will access the MSRR through the Internet and be able to browse or search the ID categories of registered resources. Resource providers will nominate resources for registration by submitting the MSRR registration form; they will work with IDCs to ensure that their resource is correctly placed within the domain taxonomies, cross-referenced in the ID categories, and registered in the MSRR registration database.

d. The MSRR resources will include models and simulations, Simulation Object Models (SOMs), Federation Object Models (FOMs), CMMS, algorithms, instance databases and data sets, data standardization and administration products (e.g., data models and data element standards), documents, tools, IDs, and metadata about the different resources [e.g., collection of M&S directories; releasibility and security information; verification, validation, and accreditation (VV&A) information about models and simulations; and verification, validation, and certification (VV&C) information about databases and datasets]. To ensure that resource metadata are current, avoid confusion, and minimize redundancy, most MSRR resources are provided and maintained by the resource provider; the MSRR provides links to the provider whether the registered resource is on an MSRR node or a non-MSRR node. Resources, when registered, will be tagged with all appropriate use or access restrictions. The authentication function of the MSRR supplies the information needed to manage any access restrictions placed on the resources.

[3] The ID categories are defined and described in the Architecture Document for the MSRR (ref 2.1f).

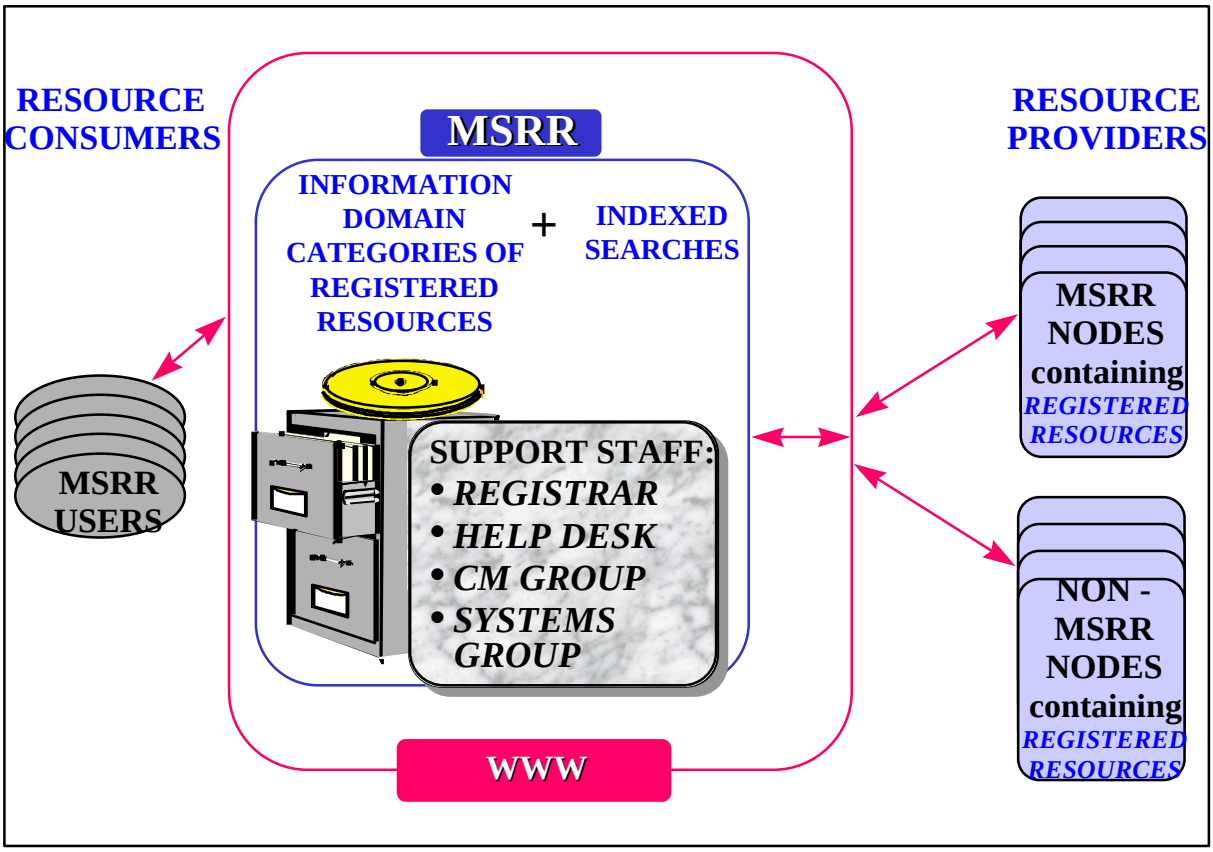

Figure 1. User's View of the MSRR

e. Resources are logically organized by IDs and physically implemented using a distributed system of resource nodes connected through the WWW. Nodes include a master node, a mirror node, and a set of registered nodes containing resources. The registration database will reside on the master node and on the mirror node. Resource consumers will be able to browse or search across the registration database to locate resources and will be able to navigate throughout the MSRR seamlessly without losing their MSRR identity. An identification/ password mechanism will be used to control access to the MSRR nodes and resources.

f. In general, information subject to the Privacy Act of 1974 should not be registered on the MSRR. Where information that will be stored on the MSRR has privacy protection requirements stated by the owner, appropriate security mechanisms will be used based on the agreement between the information owner and the Node Security Officer.

g. The MSRR will operate continuously. The master node will be mirrored and nodes with resources which are determined to be important to the operation of the MSRR will have backup systems/procedures in place. The contingency plan for each MSRR node should be consistent with and/or included in the contingency plans for the organization hosting the node. The WWW provides sufficient connectivity among the MSRR nodes to support MSRR operations.

5.4 Users/Affected Personnel. MSRR users are those engaged in M&S activities in the Office of the Secretary of Defense (OSD), the Military Departments, the Chairman of the Joint Chiefs of Staff, the Unified Commands, the Inspector General of the Department of Defense, the

Defense Agencies, and the DoD Field Activities (hereinafter referred to collectively as "DoD Components"). There are two primary classes of MSRR users: resource providers, those who generate and maintain their own product(s), and resource consumers, those who need to acquire M&S product(s).

5.5 Support Concept

5.5.1 System support

a. DMSO will be responsible for developing, maintaining, or adapting the MSRR components on DMSO-supported nodes, including software components, middleware, commercial packages, and network software. DMSO will provide tools, methodologies, and procedures for IDCs to maintain their IDs. The system support will include system administration, system backups, interaction with IDCs, interaction with NAs, daily ID category information maintenance, technology infusion, and Help Desk and Registrar operations. Custom "intrafaces"[4] will be provided to and maintained at each node.

b. DMSO will offer help or training in the use of the MSRR to locate and retrieve resources, establishment of MSRR nodes, decomposition/organization of domain taxonomies and other IDC functions, and preparation of resources for acceptance into the MSRR.

c. All components of the MSRR will be under CM, starting with the completion of Phase I. The MSRR will provide CM only to those resources which it maintains and not to those resources to which it points. The owners of the latter resources will perform the CM. The MSRR will provide CM on metadata for registered resources which are maintained in the registrar database.

5.5.2 Support to resource consumers. The MSRR will provide support to consumers by providing the Help Desk, distribution of their identification/authentication information throughout the MSRR, and tools to browse, query, and search across all registered MSRR information.

5.5.3 Support to resource providers. The MSRR will provide standards and policies that assist providers in registering their resources. When a provider nominates a resource for registration into the MSRR, the appropriate IDC will determine placement within the ID taxonomy. The MSRR will provide tools which will assist in updating the resource metadata and will provide the capability to restrict access to this resource as stated by the provider during registration.[See the User's Guide for the MSRR (ref 2.1d) and the Operations Guide for the MSRR (ref 2.1c).]

5.5.4 Support to node owners

a. The MSRR will have published procedures for operating an MSRR node, including minimum support that the node owner must provide for his node (e.g., backups, hours of operation, maintenance levels and cycles, recommended software suite). Potential node owners

[4] An MSRR "intraface" is that software and data which facilitate automated updates of registration metadata, distribution of administrative and technical information, and forwarding of authentication and search result information as the users navigate through the MSRR. (See Architecture Document for the MSRR, ref 2.1f.)

may be trained or advised in establishing MSRR nodes. (See the Operations Guide for the MSRR, ref 2.1c.)

b. To those who own nodes, training will be provided to the designated NA, and an NA will be given a point of contact to resolve technical, administrative, or legal issues concerning node operation.

c. Meetings of the Node Administrator Working Group (NAWG) will be initiated by the MSRR Program Manager on an as-needed basis to facilitate the discussion of issues associated with node administration. [See the Node Administrator's Guide appendix to the Operations Guide for the MSRR (ref 2.1c).]

5.5.5 Support to IDCs. The MSRR will provide the IDCs with a methodology to analyze, decompose, and develop their ID taxonomy and a tool to assist in executing the methodology. The IDC Working Group (IDCWG) will be established to provide support for and coordination among the IDCs. The rules that govern the IDC function can be found in Appendix B of the Architecture Document for the MSRR (ref 2.1f). IDC and IDCWG roles and responsibilities are detailed in Appendices F and G of this Architecture Document.

6. OPERATIONAL SCENARIOS

6.1 Resource Consumer Scenario. Unregistered users[5] will be allowed to browse only public information on the MSRR. To effectively use the MSRR, consumers must first register and be approved for access to MSRR resources. After logging in, consumers will be able to search for and access resources; will provide identification/authentication information only once at entry into the MSRR; and may move seamlessly from node to node within the MSRR. Consumers will be able to search across all MSRR resources from the master node by inputting search criteria and, if they receive multiple hits on a search, may move among the nodes on which the resources are stored. MSRR users will maintain their search results as long as they stay within the MSRR.

6.2 Resource Provider Scenario. A resource provider must be an authorized MSRR user. The providers may nominate their resource for registration, unregistration, and change/update to their IDC. During the registration process, they may propose the appropriate IDs or domains to which they feel their resource belongs and they must specify any access restrictions which they want the MSRR to implement with respect to their registered resource record. They are responsible for maintaining their resource and will participate in coordinating taxonomy changes with their IDC. Depending upon how they choose to register their resource and make it available to users, they may provide either ordering information or their contact information.

6.3 IDC Scenario. The IDCs must be registered MSRR users and their appointment must be approved by DMSO. They will be responsible for setting up their initial domain taxonomy and for maintaining their taxonomy. They will also help negotiate taxonomy changes with resource providers and the MSRR team to determine/minimize impacts to the MSRR taxonomy for resources/versions of resources which may be currently in use. They will be responsible for registering their domain resources in the MSRR, for ensuring that their resources are correctly

[5] A user can be a United States, foreign government, or international organization.

registered within their domain, and for ensuring that their NA is notified and intraface objects are updated when a modification is made to a resource.

7. SUMMARY OF IMPACTS

7.1 Operational Impacts. The MSRR will have a dramatic operational impact on the entire DoD M&S community. It will change fundamentally how the community does business. The M&S acquisition, training, and analysis components of the DoD will have a single stop for offering, identifying, and acquiring M&S resources, including data, algorithms, models and simulations, and other resources that may have reuse potential. This is a dramatic departure from the current way of offering and locating resources (M&S catalogs, verbal conversations with subject-matter experts) for M&S use. In addition, there will be an operational impact on DMSO and the follow-on Coordinating Committee, who will have to develop and manage the new automated way of doing business.

7.2 Organizational Impacts. An organizational impact will be felt by all users of the MSRR system. Users may need additional equipment/software, training, and the ability to grasp the change in the automated way of now offering and locating M&S resources. Users will expand their organizations to a virtual organization, crossing boundaries that heretofore may have required some formal agreement to exchange information. This flattening of organizational hierarchies will increase the efficiency and effectiveness of M&S activities.

8. ANALYSIS OF THE PROPOSED MSRR SYSTEM

8.1 Summary of Advantages. The MSRR will provide direct and indirect advantages to the M&S community and to the DoD at large. Described below are some of the features and benefits of the MSRR.

8.1.1 Cost reduction. The benefits of cost reduction will be realized with the drastic reduction in time it will take to locate M&S resources. In addition, cost reduction will promote M&S resource reuse and, therefore, reduce duplication of effort (the present level of duplication is significant). As component-based architectures become the norm, the MSRR will be the vehicle from which components are assembled into new M&S resources.

8.1.2 Structures and standards

a. The MSRR provides a general use capability for the community with minimal structures and standards imposed upon resource providers. The MSRR will allow resource providers to register nodes, individual resources, and servers without making any modifications. For those who want to participate fully in the MSRR, a reasonable set of standards and structures will be required for compliance. [See the User's Guide for the MSRR (ref 2.1d) for details.]

b. MSRR nodes will adhere to standards for WWW page design, search, and access procedures, thereby ensuring that users view the MSRR as a single, cohesive, and coherent entity. The MSRR will have formal resource acceptance criteria, which will include use restrictions, access restrictions, quality level, VV&A or VV&C data, compliance with DoD standards, descriptive information, and documentation.

8.1.3 Communications. The MSRR, in addition to being a repository, also facilitates communications within the community. As part of the system, there will be bulletin boards, newsgroups (both public and private), and mailing lists which will promote information sharing.

8.1.4 Incentives

a. Some producers already have automated repositories and others are considering instituting them. The MSRR will have addressed many of the complex issues associated with resource sharing; therefore, these organizations should be encouraged to take advantage of lessons learned and be invited to become part of the MSRR.

b. By placing its resources into the MSRR, an organization exposes its resources, capabilities, and interests to the widest possible M&S community. To the extent that these resources are reused, the producers can then support a wider group of users and can become better known.

8.1.5 Miscellaneous

a. The flip side of promoting information sharing is the identification of gaps. Once it becomes standard procedure to add M&S resources to the MSRR when they are developed, it will be possible to identify where resources are lacking, which can provide guidance for the initiation of new, MSRR-compliant[6] programs.

b. The MSRR development team will assist the IDCs to organize their information into a taxonomy which will be of significant benefit to the entire M&S community.

c. Most important, there are on the periphery of the community producers of resources who could not set up their own repositories or work through the complex issues associated with resource sharing. These producers will be able to add their products to MSRR nodes, providing resources that would be otherwise difficult to locate.

8.2 Summary of Disadvantages and Limitations

8.2.1 Bandwidth and large resources. M&S resources may be very large; therefore, due to bandwidth limitation of the present Internet, resources may need to be ordered instead of downloaded. When the Internet bandwidth is upgraded with fiber-optic cable, then downloading larger resources will be practical.

8.2.2 Costs

a. The organizational funding basis of the MSRR for long-term support needs to be institutionalized within the DoD structure.

b. With the exception of the MSRR nodes directly supported by DMSO, MSRR nodes will have to be funded by producers or others. The cost of setting up and maintaining an MSRR node could be significant. (This cost is not estimated at this time.) However, the cost would be

[6] For definition, see the Operations Guide for the MSRR (ref 2.1c).

counterbalanced by savings from reuse. Setup costs would not apply if a producer already has an Internet presence.

8.2.3 Support for resources available through the MSRR. The MSRR will be responsible for ensuring that the metadata about its registered resources are current, accurate, and complete. The MSRR will meet this responsibility through its policies and procedures and development of automated tools. The MSRR will be responsible only for the MSRR-developed and MSRR-provided resources. It will not be responsible for non-MSRR resources registered in its database, including documentation, training, contents, validity, operational use, etc.

8.2.4 Legacy repositories. The MSRR will provide links to resources on legacy repositories. Legacy repository nodes can become an MSRR node only with the addition of an MSRR intraface. The intraface may not exist for that legacy repository. On a case-by-case basis, the MSRR team may be directed by DMSO to build (or assist in the construction of) a legacy-specific intraface.

8.2.5 Software and hardware limitations. The MSRR will be limited by the state-of-the-practice WWW technology. By design, the MSRR will have no other inherent limitation.

8.3 Alternatives and Tradeoffs Considered. With the current technology, the disparate collection of M&S resources, systems, and standards, and the urgent needs of the M&S community, the use of the WWW as a communications infrastructure is the only practical strategy to implement the MSRR in an acceptable timeframe. The following paragraphs discuss some of the alternatives and tradeoffs considered.

8.3.1 Custom versus commercial software. Wherever possible, the MSRR will use commercial off-the-shelf (COTS) and Government off-the-shelf (GOTS) software. This includes commercial browsers, search engines, etc. Benefits include reduced costs, ease of acquisition and maintenance, and leverages of one of the fastest growing technology areas.

8.3.2 Funding. DMSO will provide funding to establish the initial nodes, but will not, in general, purchase additional nodes. Therefore, participating producers will have to budget for (a) MSRR node setup, or (b) hosting their resources on an existing node.

8.3.3 Authority. The MSRR nodes will operate autonomously. Autonomous operation will require effective policies, procedures, software interfaces, and coordination.

APPENDIX A. ACRONYMS

The following acronyms are used in this document and its appendix:

C4I	command, control, communications, computers, and intelligence
CM	configuration management
CMMS	Conceptual Models of the Mission Space
COTS	commercial off-the-shelf
DDRS	Department of Defense Repository System
DMSO	Defense Modeling and Simulation Office
DoD	Department of Defense
EPG	Electronic Proving Ground
EXCIMS	Executive Council for Modeling and Simulation
FOC	Final Operating Capability
FOM	Federation Object Model
GOTS	Government off-the-shelf
HLA	High Level Architecture
ID	information domain
IDC	Information Domain Coordinator
IDCWG	Information Domain Coordinator Working Group
IOC	Initial Operating Capability
JTA	Joint Technical Architecture
M&S	modeling and simulation
MSMP	Modeling and Simulation Master Plan
MSRR	Modeling and Simulation Resource Repository
MSWG	Modeling and Simulation Working Group
NA	Node Administrator
NAWG	Node Administrator Working Group
OSD	Office of the Secretary of Defense
RTWG	Repository Technology Working Group
SBU	sensitive but unclassified
SDP	Software Development Plan
SOM	Simulation Object Model
TAFIM	Technical Architecture for Information Management
USD(A&T)	Under Secretary of Defense for Acquisition and Technology
VV&A	verification, validation, and accreditation
VV&A/C	verification, validation, and accreditation/ verification, validation, and certification
VV&C	verification, validation, and certification
WWW	World Wide Web

APPENDIX B. DEFINITIONS

Information Domains (IDs): Logical groupings of related information divided into distinct functional, technical, product, and/or organizational areas of interest.

Information Domain (ID) Categories: The MSRR is logically divided into the following four ID categories:

Organizations:	The official M&S groups within the DoD.
Functions:	The mission and activities performed by the M&S organizations.
Technologies:	The building block parts of the M&S product.
Products:	The names of the M&S resources built from Technologies to support the M&S Functions.

Information Domain Coordinators (IDCs): People who have the ultimate responsibility for the outside world's view of the content and organization of the content within their information domain.

MSRR intraface: An MSRR intraface is that software and data which facilitate automated updates of registration metadata, distribution of administrative and technical information, and forwarding of authentication and search result information as the users navigate through the MSRR. (See Architecture Document for the MSRR, ref 2.1f.)

MSRR Node: The server which provides all or a portion of the MSRR functionality and is connected to the MSRR master node through the WWW.

MSRR Operations Staff: IDCs, node owners, Node Administrators, Registrar, Help Desk personnel, configuration management personnel, and systems personnel.

MSRR Registrar: The group of people responsible for the MSRR registration operation.

MSRR Resource: Information which will be registered to include models and simulations, Simulation Object Models (SOMs), Federation Object Models (FOMs), Conceptual Models of the Mission Space (CMMS), algorithms, instance databases and data sets, data standardization and administration products (e.g., data models and data element standards), documents, tools, IDs, metadata about the different resources [e.g., collection of M&S Directories, releasibility and security information, verification, validation and accreditation (VV&A) information about models and simulations; verification, validation and certification (VV&C) information about databases and datasets].

MSRR Users: Resource consumers and resource providers.

MSRR Working Groups: Working groups that support the MSRR by identifying issues, exploring solutions, and providing recommendations for approval/adoption. The three initial Working Groups are Repository Technology (RTWG), Node Administrators (NAWG), and Information Domain Coordinators (IDCWG).

Node Administrator (NA): The person responsible for administration and maintenance of the hardware and software of an MSRR node. The NA is not responsible for the information contained in the node, but only for the infrastructure of the node in support of the MSRR.